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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,339	01/18/2002	Santosh C. Lolayekar	MARA-01006US0 SBS	6530

48789 7590 01/31/2006

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EXAMINER

LIN, WEN TAI

ART UNIT PAPER NUMBER

2154

DATE MAILED: 01/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/051,339	Applicant(s) LOLAYEKAR ET AL.	
	Examiner Wen-Tai Lin	Art Unit 2154	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/14/05.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-25 and 27-44 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-25 and 27-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1, 3-25 and 27-44 are presented for examination.
2. The text of those sections of Title 35, USC code not included in this action can be found in the prior Office Action.

Claim Rejections - 35 USC § 102

3. Claims 1, 25, 27, 30, 33 and 35-37 are rejected under 35 U.S.C. 102(e) as being anticipated by Guha et al.[U.S. 20020194324].
4. Guha was cited in the previous office action.
5. As to claim 1, Guha teaches the invention as claimed including: a method for use in a storage network [e.g., Fig.4], the storage network including at least one initiator [e.g., 39-40, Fig.4], at least one storage device [e.g., 44, Fig.4], and a storage switch [e.g., an entity including 36, 34, 38 and 42 of Fig.4] in communication with the at least one initiator and the at least one storage device [i.e., the combined entity of 36, 34, 38 and 42 of Fig.4 has direct links to the initiators and the storage devices of Fig.4], the method comprising:

providing, by the storage switch, quality of service to the at least one initiator for accessing the at least one storage device in the storage network [Abstract].

6. As to claims 25 and 27, Guha teaches the invention as claimed including: a switch for use in a storage network [e.g., Fig.4; paragraph 63], the switch comprising:

a port to be coupled to an external device, wherein the external device includes at least one of an initiator and a storage device [64, Fig.6]; and

a bandwidth controller, the bandwidth controller including a processor [i.e., inherently there must be a processor in the SAN switch], a traffic manager [i.e., 34 or 36, Fig.4], and a buffer [e.g., 34-40, Fig.4; paragraph 68; note that a buffer must have existed in order to perform the tasks described at paragraphs 68-69], wherein the processor is a storage processor [e.g. 42, Fig.4,].

7. As to claims 30, 33 and 35-37, since the features of these claims can also be found in claims 1, 25 and 27, they are rejected for the same reasons set forth in the rejection of claims 1, 25 and 27 above.

Claim Rejections - 35 USC § 103

8. Claims 3-24, 29, 31-32, 34 and 38-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guha et al.(hereafter "Guha")[U.S. 20020194324], as applied to claims 1-2,

25-27, 30, 33 and 35-37 above, further in view of Choudhury et al.(hereafter "Choudhury") [U.S. 5719854].

9. Guha and Choudhury were cited in the previous office action.

10. As to claims 3-5, Guha teaches that the step of providing quality of service by applying QoS enforcer rules, which includes dropping or delaying a content request based on the service level associated with each individual SLA and the existing loading [e.g., paragraphs 20 and 68-69]. Guha does not specifically teach controlling the number of packets or concurrent requests (i.e., the traffic load caused by the requestor) from the at least one initiator to the at least one storage device.

However, in the same field of endeavor Choudhury teaches controlling the number of concurrent requests sent from an initiator as an indication of network traffic caused by the initiator [Abstract; note that since each request only occupies one packet, thus the number of packets during a limited duration is equivalent to the number of active requests].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the number of packets or concurrent requests sent out from the initiator as a measure of traffic load (caused by the initiator) and determine whether the request would be granted based on the initiator's SLA service level because Guha's system deals with constrained resources with an attempt to balancing traffic load and offering differentiated services based on each requestor's SLA [paragraph 9].

11. As to claims 6-8, Guha does not specifically teach that the step of providing quality of service includes adjusting the number of requests allowed the initiator to keep the bandwidth utilized by the at least one initiator within a specified range.

However, in the same field of endeavor, Choudhury teaches that customer's requests is bounded by and upper and lower bounds in accordance with the customer's QoS agreement, wherein these bounds are mapped to maximum and minimum resource capacities that can be used by the customer [col.8, lines 36-63; col.14, lines 13-16] and wherein the resource capacity may be measured as the available bandwidth in the associated resource [col.2, lines 20-29], wherein the actual bandwidth is measured by a number of requests per second times an average size of requests from the at least one initiator (i.e., the expected capacity used – see col.14, lines 13-16)).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Guha and Choudhury by adjusting the initiator's use of the network bandwidth to within a specified range (i.e, within a predetermined minimum and maximum bounds) because controlling the bandwidth utilization range is an effective way of controlling the initiator's traffic load, which obviously corresponds to the number of concurrent requests times the average size of each request from the initiator and is directly tied to the Guha's service grade, as part of the initiator's QoS agreement.

12. As to claim 9, since the features of this claim can also be found in claims 1-8, it is rejected for the same reasons set forth in the rejection of claims 1 and 3-8 above.

13. As to claim 15, Guha and Choudhury does not specifically teach that measuring the actual bandwidth includes determining if a buffer includes a number of packets beyond a specified threshold.

However, it is well known in a traffic route with a buffer for temporary storage of transferred packets the level of the buffer is proportional to the actual bandwidth utilized. Thus it is obvious to one of ordinary skill in the art to use buffered data upper and lower levels as means of measuring the average bandwidth utilization because measuring the buffer level could naturally average out the burst nature of network traffic.

14. As to claims 10-14 and 16, since the features of these claims can also be found in claims 1 and 3-9, they are rejected for the same reasons set forth in the rejection of claims 1 and 3-9 above.

15. As to claim 20, Guha teaches that the targets are virtual targets [paragraph 60; i.e., the virtual storages].

16. As to claims 17-19 and 21-22, since the features of these claims can also be found in claims 1 and 3-16, they are rejected for the same reasons set forth in the rejection of claims 1 and 3-16 above.

17. As to claim 24, Choudhury teaches that the number of requests allowed the initiator is the number of concurrent requests allowed the initiator [col.6, lines 34-39; col.11, lines 14-25].

18. As to claims 23, 29, 31-32, 34 and 38-44, since the features of these claims can also be found in claims 1 and 3-22, 24-25, 27, 30 and 33-37, they are rejected for the same reasons set forth in the rejection of claims 1 and 3-22, 24-25, 27, 30 and 33-37 above.

19. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guha et al.(hereafter "Guha") [U.S. 20020194324], as applied to claims 1-27 and 29-44 above.

20. As to claim 28, Guha does not specifically teach that the port and the bandwidth controller are on one of a plurality of linecards in the switch, wherein each linecard includes a respective port and a respective bandwidth controller.

However, it is well known in the art that a wide variety of network management subsystems can be implemented on linecards.

It would have been obvious to one of ordinary skill in the art at the time the invention was made that Guha's bandwidth controller may also be implemented on a linecard because this form of implementation makes it rather easy to expand or upgrade the functionalities of the controller.

21. Applicant's arguments filed on 11/14/2005 for claims 1, 3-25 and 27-44 have been fully considered but they are not deemed to be persuasive.

22. Applicant argues in the remarks that:

(i) Re. claims 1-2: Guha's QoS Enforcer is not part of the switches (38 or 42) shown in Fig.4, wherein the layer-4 switch (38) is not part of the storage area network. Therefore Guha does not disclose a storage switch as featured in claims 1-2 (now merged as claim 1).

(ii) Re. claims 25-27: Guha's does not disclose a storage switch that includes a bandwidth controller, wherein the bandwidth controller further includes a processor, a traffic manager, and a buffer.

(iii) Re. claim 30: Guha does not disclose a traffic manager that "activates the request controller" based on a specified threshold in the buffer being reached.

(iv) Re. claims 3-24, 29, 31-32, 34 and 38-44: Guha and Choudhury in combination does not disclose the limitations in these claims.

23. Examiner respectfully disagrees with applicant's remarks:

1. **Regarding point (i) and (ii):** Applicant is reminded that the office action purportedly cited numerals 34, 36, 38 and 42 as one entity that corresponds to Applicant's "storage switch" because the specification has clearly defined the physical boundary (e.g., in terms of chip, board, or chassis) of a storage switch. Instead, Applicant describes at paragraph 46 on the functionalities of the storage switch to include "the functions of switch, appliance, and gateway ..." and "additional functions include functions ... such as load balancing, ... Quality of Service". As admitted by the Applicant, "such additional functions include functions that are performed by other devices in conventional systems". It is submitted that the cited entity, which incorporates the functionalities of 34, 36, 38 and 42 of Fig.4 clearly reads on the claimed limitations in

amended claims 1 and 25. (Note that numeral 42 was not cited as part of the storage switch in the previous office action due to a typographical error).

2. Regarding point (iii): It is noted that the threshold as appeared in the claim language is nothing but some observable traffic level, but is pretty much an unknown because there is no description as how the threshold is formed. In fact, Guha describes at paragraph 69: “If the expected traffic increases to, for example, more than 75% load that is nominally expected, the content controller 36 might create and allow access to replicate web content that is accessed by the web server 41”, wherein the “75% load” is a prescribed traffic level that, in this particular example, corresponds to a threshold.

3. Regarding point (iv): when joining numerals 34, 36, 38 and 42 of Fig.4 as one entity that corresponds to Applicant’s switch, it becomes clear that Guha’s storage switch has direct link to at least one initiators (39-40, Fig.4) and at least one storage devices (44, Fig.4). See also the relevant paragraphs in the instant office action.

For at least the above reasons, it is submitted that the prior art of record reads on the claims.

24. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

25. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Examiner note: Examiner has cited particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wen-Tai Lin whose telephone number is (571)272-3969. The examiner can normally be reached on Monday-Friday (8:00-5:00) .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on (571)272-3964. The fax phone numbers for the organization where this application or proceeding is assigned are as follows:

(571)273-8300 for official communications; and

(571)273-3969 for status inquires draft communication.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wen-Tai Lin

January 21, 2006

Wen-Tai Lin
1/21/06